

**FISCAL YEAR 2006
SUPERIOR NATIONAL FOREST
MONITORING & EVALUATION REPORT**

EXECUTIVE SUMMARY

MARCH 2008



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Fiscal Year 2006
Superior National Forest Monitoring & Evaluation Report

The 2004 Superior National Forest (SNF) Land and Resource Management Plan (Forest Plan) was approved on July 30th 2004. The National Forest Management Act planning regulations specify that, "at intervals established in the Forest Plan, implementation shall be evaluated on a sample basis to determine how well objectives have been met and how closely management standards and guidelines have been applied. Based on this evaluation, the interdisciplinary team shall recommend to the Forest Supervisor such changes in management direction, revisions, or amendments to the Forest Plan as are deemed necessary."

This Monitoring and Evaluation Report (M&E Report) report summarizes and evaluates the results of monitoring Forest Plan implementation from October 2005 through September 30th 2006 including Boundary Waters Canoe Area Wilderness (BWCAW) monitoring items described in the Forest Plan.

The 2006 M&E Report framework utilizes the Forest Plan Monitoring Chapter (Monitoring Chapter) as its foundation (See Plan, Chapter 4). The Monitoring Chapter outlined the following four-step approach to conduct monitoring and disclose findings;

- (1) Monitoring Chapter: Provides strategic monitoring direction.
- (2) The Monitoring Guide: Provides prescriptive monitoring framework.
- (3) The Annual Monitoring Schedule: Provides current year specific prescriptive direction.
- (4) Monitoring & Evaluation: Provides previous year findings and identifies applicable management recommendations.

The Monitoring Chapter was approved as part of the Record of Decision (ROD) in July 2004. The Monitoring Guide was developed by a Forest Interdisciplinary Team (IDT) and completed during the spring of 2005. The Annual Monitoring Schedule was finalized jointly by the Forest IDT and District Rangers and their staff in June of 2005. This M&E Report constitutes step 4.

This report is intended to be comprehensive, displaying monitoring conducted, evaluation management recommendations and follow-up actions, partnerships, and conclusions. Additional details on selected resources are found in the Appendices. An abbreviated summary or Executive Summary is also available. The Executive Summary describes the Program Overview, Evaluation, and Management Recommendation sections.

Monitoring and Evaluation Report Objectives

The following is a list of the primary objectives of the M&E Report:

- (1) Provide current progress in implementing Forest Plan direction, including reaching desired conditions and producing goods and services.
- (2) Validate effectiveness of specific management practices.
- (3) Share status/results of other agencies'/institutions' cooperative monitoring.
- (4) Summarize available information on Management Indicator Species and Management Indicator Habitats.
- (5) Summarize large scale or significant projects or programs.
- (6) Provide an update on new applicable research and status of research needs.
- (7) Identify and/or provide status of any needed Forest Plan amendments.
- (8) Identify any needed changes to monitoring.
- (9) Provide consistency in inventory and monitoring practices and methods.

Monitoring and Evaluation

Each Resource Section contains the following: (1) Monitoring Conducted; (2) Evaluation of Desired Conditions, Objectives, Standards and Guidelines; (3) Management Recommendations and Follow-up Actions; (4) Opportunities to Improve Efficiencies; and (5) Summary Conclusions. Monitoring activities and Evaluation are displayed by pertinent Monitoring Question and corresponding Monitoring Driver. A Monitoring Driver is the Forest Plan Desired Condition, Objective, Standard or Guideline that identifies the reason why the SNF monitors a particular resource (See Forest Plan Chapter 4, p. 4-7). A more thorough explanation for each section is as follows:

(1) Monitoring Conducted. This section displays (a) applicable monitoring activity, practice or effect measured; (b) monitoring methods; (c) when monitoring occurred; and (d) location of monitoring for each Monitoring Driver.

(2) Evaluation. This section describes accomplishment contribution towards Forest Plan desired conditions. Narrative, tables or graphs portray Existing Conditions as of July 2004 when the Record of Decision was signed, Decade 1 Forest Plan objectives and/or FEIS Desired Conditions, and Fiscal Year (FY) 2006 accomplishments. Accomplishments are further delineated by accomplishments actually performed during this reporting period and accomplishments yet to be implemented that have been approved in a signed site-level project decision document. This is intended to give the reader insight into the direction a particular resource is headed.

(3) Follow up Actions and Management Recommendations. Specific follow up actions and recommendations for ongoing or future projects are identified.

(4) Opportunities to Improve Efficiencies. Collaboration, efficiencies, and public involvement opportunities are identified within this section.

(5) Summary Conclusions. This section provides a brief overview of program highlights and key monitoring and evaluation findings.

(6) Appendices. Appendices A-F summarize: Recommended follow-up actions, management recommendations, summary conclusions, achievement of vegetation objectives, and achievement of sensitive plant species objectives.

The SNF looks forward to your review of the 2006 Monitoring and Evaluation Report and any comments you may have.

Key Achievements in 2006

Cooperation

Summary Conclusions of Cooperation during FY 2006 were:

-Volunteers provided:

- 27,308 hours of service at an appraised value of \$409,620 to the SNF.

-82 Signed Formal Agreement Resulted In:

- \$447,206.13 worth of cash and services to the Superior National Forest from partners
- \$524,384.23 worth of cash, goods and services to partners from the Superior National Forest.

-Partners and Forest Service Staff:

- Initiated 48 new agreements
- Modified 68 existed agreements



Air Quality

During 2006, air pollution was monitored for two principle sources: (1) sources outside the SNF and its effects on forest ecosystems, human health, and/or human enjoyment of forest resources; and (2) Superior National Forest management activities, particularly prescribed burning. Summary Conclusions revealed from this monitoring were:

- Overall, air quality monitored at Fernberg showed no major changes from that seen over the past five years.
- Smoke monitoring of the Cavity Lake wildfire and Turtle Lake wildfire use fire showed some days with values over the EPA health standard.
- Since smoke from prescribed fire can generally be managed to avoid air quality impacts, it is important to complete prescribed fire projects so that large wildfires and their smoke impacts can be prevented.
- Because of proposed industrial projects for the Iron Range, it will be important to monitor their impacts on SNF air and water quality.



Satellite Photo of Smoke From Cavity Lake (Upper right) and Turtle Lake fires.

Watershed-Riparian



Stream crossing restoration project

During 2006, stream reaches, stream crossings, restoration projects, lake water chemistry, and mercury accumulation in fish and wildlife species were monitored. Summary Conclusions revealed from this monitoring were:

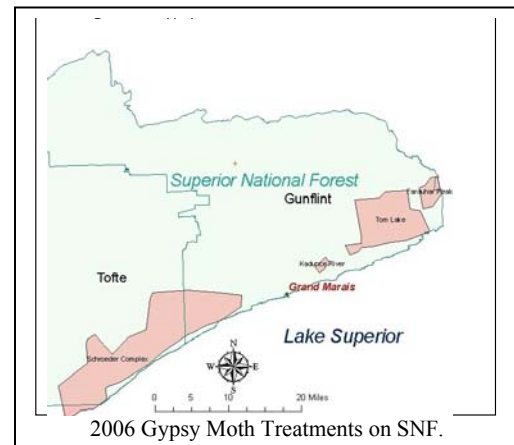
- Stream monitoring reaches were established at 18 sites on 20 streams and rivers
- Road/stream crossing surveys were completed at 139 locations.

- Stream monitoring reaches were established at 18 sites on 20 streams and rivers.
- Stream crossing surveys were completed at 139 locations.
- 10 road/stream crossing sites were restored.
- Where large woody debris structures were increased, stream bed scouring and gravel deposition were documented.
- The chemistry of two groups of lakes was monitored. In the 1st group, baseline fire effects on lake chemistry and mercury in fish were sampled as part of a study that began in 2004. A 2nd group of lakes was sampled to document long term changes in lake chemistry.
- The SNF assisted researchers from the DNR and other organizations in sampling game fish and loons for mercury contamination.
- Results of Minnesota Forest Resource Council (MFRC) implementation auditing of FY 2006 timber sales demonstrate good use of appropriate Best Management Practices (BMPs). In particular, water quality BMPs were found to be successfully implemented.
- Update the upland young/upland open analysis for the entire Forest every three years.
- Continue to encourage that vegetation management National Environmental Policy Act (NEPA) decisions include proactive riparian management, particularly in the near-bank zones.

Insects and Disease

Items monitored included management of insect and disease populations and forest managed towards healthy condition. Summary Conclusions revealed from this monitoring were:

- A significant increase in spruce budworm population was observed with much of the infestation occurring within Boundary Waters Canoe Area Wilderness (BWCAW). This insect defoliated 114,817 acres during 2006 which is an increase from 92,500 acres defoliated in 2005.
- Approximately 640 acres of reproducing gypsy moth populations were treated and eradicated. In addition, approximately 133,000 acres were treated with the pheromone *Disparlure*.
- Vegetation manipulation was used extensively to mitigate potential insect and disease impacts. Practices implemented included the planting of 1,218,000 native conifer seedlings on 2,318 acres, seeding 57 acres to conifer species, and improving 4970 acres through TSI treatments.



Fire



During 2006, over 43,000 acres within the BWCAW burned from wild and prescribed fires. Approximately 13,000 of the 43,000 acres were scheduled prescribed burn units that were burned by the Cavity wildfire. These wildfires provided managers an excellent opportunity to compare fire effects between prescribed and wildfires, particularly to: (1) validate the effectiveness of previous year's prescribed burning in preventing or minimizing the possibility of wildfires from exiting the wilderness and threatening life and property; and (2) validate prescribed burn mitigation measures in protecting wilderness resources. Summary Conclusions for the Fire Program were:

- The Boundary Waters Environmental Impact Statement (BWEIS) identified 84,000 acres for fuels treatment. During FY 2006 within the BWCAW, 3,510 acres of blow down fuels were intentionally treated and five burn units encompassing 13,426 acres were burned by the Cavity wildfire. The cumulative acres treated through the end of FY 2006 is 43,279 acres, which is about 50% of the 84,000 acres identified for treatment in the BWEIS.
- The completed prescribed fire units did reduce and in some cases prevent the Cavity wildfire from spreading from the BWCAW into areas of urban interface and across the border into Canada.
- Monitoring findings did validate that mitigations outlined in the BWEIS and Burn Plans were successful in protecting the soil organic layer, eagle nests, shoreline old forest, and interior old forest.
- The preponderance of fire in blow down demonstrates the continued high fire risk of these fuels 7 years following the 1999 windstorm. This risk is further enhanced by conifer succession, particularly increased balsam fir and spruce budworm infestations.
- Increase prescribed fire within red & white pine forest to promote seedling establishment.
- Community Wildfire Protection Plans (CWPP) were completed with Cook and Lake counties and initiated with St. Louis county.

Timber

Summary Conclusions for the Timber Program were:

- FY 2006 had the highest volume sold and under contract since the Revised Forest Plan was approved. However volume harvest was less in 2006 because of a major downturn in the timber market. The Forest had eight sales that received no bids which amounted to 22.7 MMBF.
- The SNF awarded 57,295 MMBF within twenty timber sales on 6088 acres but *actually* harvested 32,445 MBF on 4049 acres.
- To date 8,369 acres or 6% of the projected Decade 1 acres and 81,035 MMBF or 8% of the projected Decade 1 volume has been harvested since 2004.
- When vegetative treatments planned in approved 2005 and 2006 project decisions are fully implemented, a total of 36,000 acres or 27% and 229 MMBF or 22% of Decade 1 projections will have been achieved.
- During 2006, 4,629 acres were certified and 3,672 acres harvested but not certified.
- During 2006, approximately 60% of vegetative treatments were clearcut compared to 88% clearcut during 2005. When treatments planned within approved 2006 decisions are included with actual treatments, the estimated percent of vegetation treatments being clearcut drops to 59% which is trending towards the Decade 1 projection of 63% acres treated to be clearcut.
- Neither treatments within actual harvest units nor harvest treatments combined with adjacent existing young stands created young patches that approach 1,000 or even 300 acres. However, when approved 2005 decisions are implemented, eight patches greater than 300 acres will be created for a total of 4,218 acres.
- Five applicable Standards and Guidelines were monitoring during 2006 and all were successfully met and reduced environmental effects as predicted.
- There is a need to improve data collection and data management during NEPA project planning because insufficient data collection and field reconnaissance during the NEPA analysis has resulted in actual treatment acreage 20-25% less than planned.



Non Native Invasive Species (NNIS)



Photo 5 Knife Lake purple loosestrife pull

Approximately 2,025 acres of terrestrial NNIS Plant Species occur on the SNF. Highest risk species include common buckthorn, leafy spurge, purple loosestrife, spotted knapweed, Canada thistle, Tartarian honeysuckle, and goutweed. Six lakes known to be infested with spiny water flea include Flour, Greenwood, McFarland, Pine, Saganaga, and Crane Lakes. Rusty crayfish are now known to occur in at least twenty-five lakes on the SNF. It is likely that other lakes may be infested but have not been surveyed or monitored. Existing NNIS populations are of obvious concern. However, the potential establishment and expansion of NNIS in additional habitat is also a concern. Correspondingly, the SNF has focused detection efforts within susceptible habitats, particularly those adjacent to existing NNIS populations. Summary Conclusions revealed from this monitoring were:

- Seven prevention/education measures were implemented.
- Approximately 20 acres of terrestrial NNIS were treated, up from 8 acres treated during 2005.
- Despite an increase in documented terrestrial plant infestations since 2004, the rate of treatment is greater than the rate of NNIS increase.
- New and existing spiny water flea populations on the SNF suggests that this species' current rate of invasion is likely increasing.
- The number of lakes where rusty crayfish has been detected has increased each year since 2003 and it is likely that new infestations will be documented with increased survey and monitoring.
- There were no aquatic NNIS populations contained or eradicated in 2006.

Vegetation

Overall during this first full year of implementation, projects are moving the SNF toward desired conditions. Summary Conclusions revealed from this monitoring were:

- Preliminary results, while mixed, indicate that vegetation conditions on a Forest-wide scale are generally moving towards the desired Forest Plan objectives. Possible exceptions pertaining to vegetative composition include:
 - Within the Mesic Red and White Pine Landscape Ecosystem (LE), the Northern hardwoods forest type may exceed Decade 1, 2 and Long-term (100 year) objectives.
 - Within the Jack-Pine Black Spruce (JPB) LE, the white pine forest type is likely to exceed Decade 1, 2 and Long-term (100 year) objectives. The forest type would only be 4% instead of 3% at this time and the difference is minor.
- Within the Red/White Pine Mature Forest, the acreage of patches greater than 300 acres increased from 6,000 acres in 2005 to 7,061 acres in 2006.
- Within zone 1, the number of 1,000 acre patches reported in 2006 was 5, which is three less than the Forest Plan guideline of eight patches.
- Within zone 2, Forest Plan direction is to maintain 1 patch at 11,700 acres which occurred in 2004. Monitoring indicates that this patch has been fragmented to less than 10,000 acres.
- Continue to integrate the Native Plant Community Classification concept into inventory efforts on the SNF. In 2006, this classification option was integrated into the Field Sampled Vegetation database, a Forest Service-wide application.

Wildlife. Management Indicator Species and Habitat.

Aquatic

The SNF monitored lake and stream habitat and success of habitat improvement projects. Summary Conclusions revealed from this monitoring were:

- The Superior National Forest and other agencies assessed lake and stream fish populations within the Dark River and two lakes (Crooked and Fourmile Lakes). Surveys indicate that stream brook trout populations have remained relatively stable, walleye population in Crooked Lake had changed little since 2002 and walleye abundance in Fourmile Lake had increased substantially.
- Working with the Minnesota Department of Natural Resources, Fond Du Lac Band of Lake Superior Ojibwe, and the 1854 Tribal Treaty Authority has increased the SNF's ability to monitor management indicator habitats as well as important lake and stream fish populations.
- The strategies recently developed to monitor lake and stream habitat restoration projects (7 road/stream crossings) have been very successful.
- Monitoring associated with the Dark River Habitat Restoration Project should continue every 2-3 years.



Terrestrial MIH

Management Indicator Habitats (MIHs) are defined by their forest types and ages. MIHs 1-9 were monitored and evaluated. Analysis of MIH 10 (Mature Upland Riparian Forest) and MIH 11 (Forest Edge) was not conducted in 2006 because change to conditions was very minor. Analysis of amount of MIH 12 (Upland Interior Forest Habitat) and MIH 13 (Large Patches of Upland Mature Forest) is found in the Vegetation Resource section of this report. No need for change in the Forest Plan for management indicator habitat objectives is identified. During this second year of implementation, projects generally are moving the SNF toward desired conditions and objectives. Summary Conclusions revealed from this monitoring were:

- The amount, spatial distribution, and trend of MIHs 1-9 were monitored primarily by measuring forest vegetation conditions.
- In 2006, our conclusion was that there has been no significant change in species' populations or to environmental impacts assessed through the Revised Forest Plan due to our management in the first two years of implementation.
- On an annual to five year basis the SNF and its partners are continuing to actively monitor or inventory a wide array of species including: (1) *Breeding forest birds* (2) *Terrestrial game species* (3) *Frogs & Toads* (4) *NNIS* (5) *RFSS* and (6) *T&E Species*.
- For most of the MIHs, conditions are trending toward Forest Plan objectives and Forest Plan EIS expected conditions analyzed in EIS Chapter 3.3.1. Therefore, management actions in the first two years of implementation for these MIHs are consistent with Forest Plan direction and the extent to which conditions are moving toward objectives is acceptable.
- There are Young, Mature, Old/Old Growth, and Multi-aged Forest MIHs where current trends are not moving toward LE objectives for the first decade of Forest Plan implementation. However, these increases do not present a detectable concern at Year 2 of Forest Plan implementation.

Wildlife. Region Forester Sensitive Species (RFSS)

Aquatic

Highlights of monitoring aquatic RFSS were as follows:

- The SNF completed several stream habitat restoration and monitoring projects that directly or indirectly benefited Regional Forester Sensitive Species (RFSS), including the restoration of 10 road and trail stream crossings and habitat surveys of 28 sites along the Dark River.
- Established long term stream monitoring sites should be monitored at least once every 3-5 years.



Creek heelsplitter mussel. RFSS.

Plants



Small shinleaf plant and habitat found in project area. Plants were first found at the site in 2002

The general conclusion reached is that in 2006, Forest Plan direction for sensitive plants was being met. For a number of sensitive plants there was a notable increase in the number of known occurrences. This is primarily related to the amount of search effort that has been expended in the last few years. Summary Conclusions revealed from monitoring were:

- Some of the sensitive vascular plants and most of the non-vascular plants have about the same number of occurrences in 2006 as in 2004.
- Transplanting *Botrychium* worked, but not very well, and should be avoided as a mitigation measure unless no other choices exist.
- Preliminary results suggest that spring burning has a neutral effect on some species of *Botrychium*.

Minerals

Components of the minerals program monitoring included federal hard rock prospecting and exploration, private minerals, production, and restoration. Highlights of the 2006 program were as follows:

- Federal mineral operations, which are permitted and administered by the Bureau of Land Management, were found to be in compliance and no notices of noncompliance were issued.
- The following are permit applications, expirations, and relinquishments accomplished in 2006:
 - 25 prospecting permit applications were received.
 - 5 prospecting permits were issued encompassing 12,083 acres.
 - 3 prospecting permits expired.
 - 9 prospecting permits were relinquished by the companies.
 - 2 hardrock mineral leases on 4,945 acres were administered.



Coldspring Granite Company Black Granite Quarry. Kawishiwi Ranger District

- A total of 9,612 tons of granite from two quarries were sold for \$90,330.
- A total of 196,121 tons of sand and gravel were sold for \$48,663.
- 7,588 tons of mineral materials valued at \$5,149 were used by the SNF for administrative purposes.
- A framework for managing federal hardrock minerals with the BLM would be beneficial to improve the permitting process and to help guide how the two agencies cooperatively work together.

Social and Economic Stability

SNF expenditures and sold saw timber to pulpwood ratios were monitored. Summary Conclusions reached from monitoring were:

- Total expenditures (funding) for FY 2006 were about \$27,059,000, which represents a 13% increase from the FY 2005 budget of \$23,720,000.
- During 2006, the ratio of sold sawtimber to pulpwood was 15:85. This compares to the FY 2004 ratio of 11:89 and the FY 2005 ratio of 10:90.

Tribal Rights and Interests

Project consultation and government-to-government contacts were made in the following programs, projects and incidents: Forest Heritage Program, Burial Sites, Big Rice Wild Rice Meeting, Moose Lake Access, Walleye Assessment on Cadotte Lake, East Zone Travel Management, Regional Forester Sensitive Species surveys, Non-native Invasive Plant Management, South Fowl Trail project, Vegetable Chain project, Devil Trout Vegetation Management, Chikwauk Passport In Time (PIT) project, Sand Lake PIT project and archeological excavation, Echo Trail project, Whyte project, and Air Quality projects.

Heritage Program



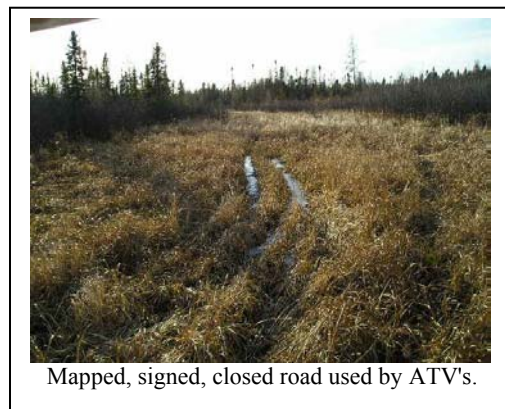
The Forest Plan and the 5 year heritage work plan directs the SNF to identify, evaluate, protect, monitor and interpret heritage resources on the Superior National Forest. Highlights of the 2006 program were as follows:

- Approximately 24,000 acres were inventoried for heritage resources resulting in the documentation of 6 new sites.
- 114 previously inventoried heritage sites, 12 eligible sites open to public interpretation, and 12 burial sites were monitored.
- 3 sites associated with a Passport in Time project were evaluated.

Recreation Motor Vehicles (RMV's)

RMV management and opportunities, effects, and changes in the Recreation Opportunity Spectrum (ROS) were monitored. Summary Conclusions reached from monitoring were:

- During FY 2005 and 2006, four projects made decisions to designate approximately 37 miles of road open to RMV travel and 81 miles of roads closed to RMV through closure or decommissioning.

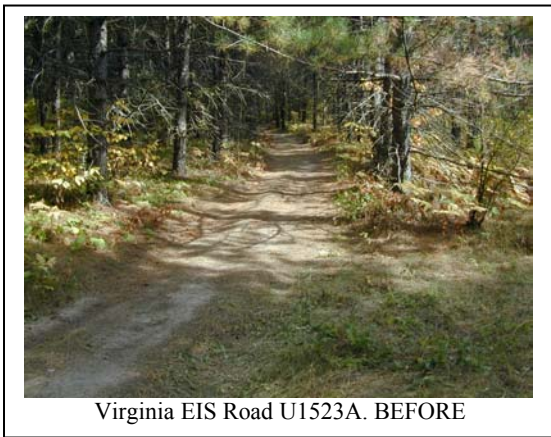


- As a percentage of roads visited, RMV use on closed roads is similar between 2005 and 2006, while the percentage of user created trails encountered was down during 2006 compared to 2005 (44% in 2005 compared to 31% in 2006).
- All of the road spurs found inside the BWCAW originated from an older established road that was apparently associated with older timber sales or other access purposes.

Transportation

The focus of monitoring during 2006 was documenting road status changes resulting from management actions and road decommissioning effectiveness. Summary Conclusions reached from monitoring were:

- Unclassified road mileage increased 61 miles since FY 2005 due to discovery of previously unknown unclassified roads.
- National Forest System OML 1 and 2 roads increased 83 miles since 2004 largely due to the designation of unclassified roads to System roads and not new construction. This increase in OML 1 and OML 2 road mileage achieves approximately 30% and 102% of Decade 1 projected conditions respectively.
- Three miles of System road were actually decommissioned and approximately 63 miles of roads approved for decommissioning but not yet implemented were identified in four Decision Documents. The miles of roads decommissioned and approved to be decommissioned represents 75% of the 83 miles projected by the end of Decade 1.
- Monitoring revealed that road decommissioning practices and procedures have been effective at re-vegetation and prevention of unwanted motorized use.



Wilderness

Three Wilderness activity categories were monitored during 2006. These included: (1) Visitor Use; (2) Campsite Conditions; and (3) The 10 Year Wilderness Stewardship Challenge. The major Summary Conclusion reached through monitoring was:

- Due to extra funding and newly created or enacted management plans, the Superior National Forest is at 57% of the wilderness stewardship level, and plans to go beyond 60% after 2007 due to advances in Element 2 – Non-native, Invasive Plants.

Lands

Lands Program activities monitored and evaluated included land purchase, land exchanges, pilot conveyance, third party partnerships, and appraisal of the BWCAW. Program highlights were:

- One 43 acre property valued at \$240,000 was purchased.
- One land exchange was completed whereby 720 acres of federal land was exchanged for 760 acres of non-federal land.
- Through Pilot Conveyance, seven properties totaling 16.16 acres of land with structures were sold for \$770,000.
- Research and data collection as part of the Thye-Blatnick Act to appraise Federal lands within the BWCAW was initiated.
- The Trust for Public Land (TPL) secured three parcels (Long Island, Chain Saw Sisters, and Clarke properties).

Public Health

Items monitored on the SNF included: (1) Potable Water Supply Bacteria (PWSB); (2) Potable Water Supply Nitrates (PWSN); and (3) Designated Swimming Sites Bacteria (DSSB). Summary Conclusions reached from monitoring were:

- Monitoring for Potable Water bacteria and nitrates was done monthly at public and administrative facilities. All nitrate samples and over 98% of bacteria (total coliform) samples were found acceptable.
- Four swimming beach samples were collected and analyzed in 2006. One sample registered a bacteria presence but was below the standards for posting.